

# Post-ShakeAlert® Message Summary

## Earthquake:

Advanced National Seismic System (ANSS):  
M 4.0 - 1.6 km (1.0 mi) NE of San Ramon  
ANSS location: 37.792, -121.967  
ANSS depth: 10.9 km (6.8 mi)  
ANSS origin (Local): 2021-11-17 11:43:43.6  
ANSS origin (UTC): 2021-11-17 19:43:43.6  
ShakeAlert origin (UTC): 2021-11-17 19:43:48.3  
ShakeAlert Event ID: ew1637178220

## ShakeAlert Messages Issued (after origin time):

Initial: 4.8 sec  
Peak magnitude: 4.8 sec  
Final: 9.1 sec

## ShakeAlert System Magnitude Estimates:

Initial: M 4.2  
Peak: M 4.2  
Final: M 4.1

## ShakeAlert System Location Accuracy:

Initial: 1.3 km (0.8 mi) S  
At peak mag.: 1.3 km (0.8 mi) S  
Final: 0.8 km (0.5 mi) NW

## Wireless Emergency Alert:

WEA alerts are distributed to the MMI 4+ area if ShakeAlert Peak M>=5.0

## Number of Stations Reporting:

2 within 10 km of epicenter  
101 within 100 km of epicenter  
36 used in final ShakeAlert Message

## Nearby Cities:

City	Distance	Time*	MMI**
San Ramon	2 km (1 mi)	~0 sec	4
Hayward	17 km (11 mi)	~1 sec	2
Oakland	27 km (17 mi)	~3 sec	2
San Francisco	40 km (25 mi)	~7 sec	<2

Radius shaken before message release: 17 km (10 mi)

## Footnotes:

\* Time -- Time between message release and arrival of the S-wave at the location.

\*\* MMI -- Modified Mercalli Intensity: a scale to measure ground shaking severity.

\*\*\* For earthquakes deeper than ~15 km, the ShakeAlert Message may be sent before peak shaking reaches the surface.

## Disclaimer:

This information is provisional and subject to revision. It is being provided to meet the need for timely best science. The information has not received final approval by the U.S. Geological Survey (USGS) and is provided on the condition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.

To learn more about ShakeAlert®, visit [www.shakealert.org/FAQ](http://www.shakealert.org/FAQ)

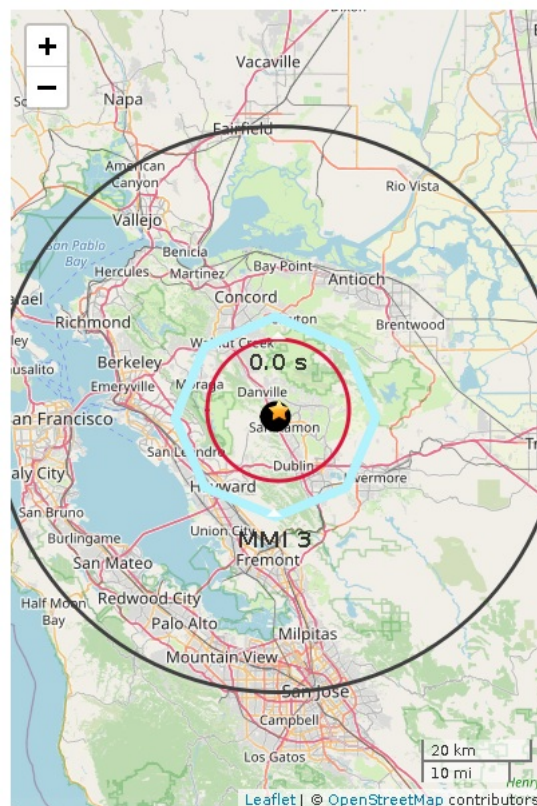


Figure 1. ShakeAlert initial earthquake location (black dot). Star is ANSS earthquake epicenter. Polygon approximates the outer range for felt ground motion. If shown, red circle is front of peak shaking when the message was released\*\*\*. Shaking takes 10 s to expand from circle to circle.

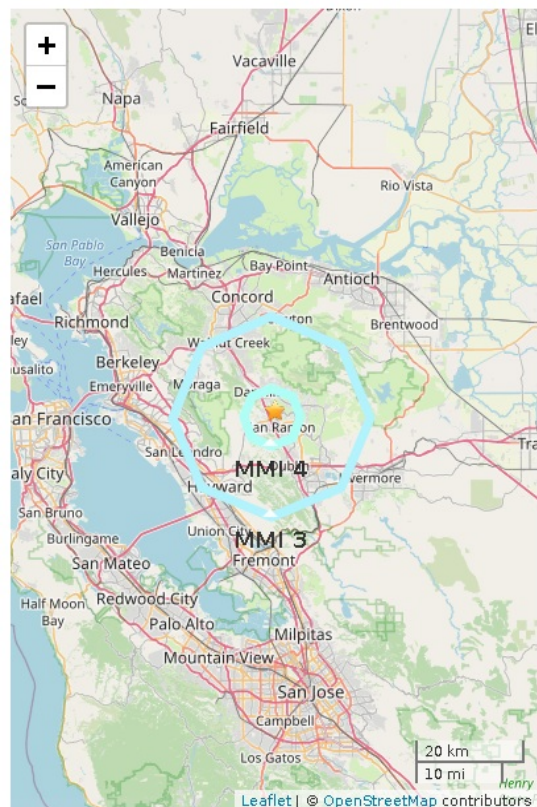


Figure 2. Polygons show shaking intensity contours for the peak magnitude estimate. Shaking of MMI 3 or less is often not felt. Star shows the ANSS earthquake epicenter.

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